

## CLAIMS

What is claimed is:

1. A robot system including a beacon with a transmitting part to transmit light to determine location, a mobile robot with a receiving part to receive the light, the beacon comprising:
  - a rotation driving part to rotate the transmitting part; and
  - an encoder to add phase information regarding rotation of the transmitting part to the light, andthe mobile robot comprising:
  - a location determiner to determine a location of the mobile robot based on the phase information of the light received by the receiving part.
2. The robot system according to claim 1, wherein the transmitting part further comprising:
  - at least one transmitter spaced from each other and rotated by the rotation driving part.
3. The robot system according to claim 1, wherein the transmitting part further comprising:
  - a mirror disposed at an incline with respect to a horizontal direction; and
  - a transmitter to emit the light at a predetermined incident angle; wherein:
    - the rotation driving part rotates the mirror, and
    - the encoder adds the phase information regarding rotation of the mirror to the light.
4. The robot system according to claim 3, wherein the transmitting part further comprising:
  - two transmitters to emit light towards double sides of the mirror.
5. The robot system according to claim 1, wherein the receiving part further comprising:
  - at least one receiver to receive the light transmitted from the transmitting part.
6. The robot system according to claim 1, wherein the receiving part further comprising:

a conical mirror to reflect light from various directions towards one direction; and  
a receiver to receive the light reflected from the conical mirror.

7. The robot system according to claim 1, wherein the beacon has inherent beacon information, and the encoder adds the beacon information and the phase information to the light.

8. The robot system according to claim 1, wherein the location determiner determines the location of the mobile robot based on the displacement of the mobile robot, and the phase information received by the receiving part.

9. The robot system according to claim 1, wherein the rotation driving part outputs information on a phase shift of the transmitting part relative to a reference direction in accordance with the rotation of the rotation driving part.

10. The robot system according to claim 1, wherein the robot system further comprises:  
a plurality of beacons.

11. The robot system according to claim 10, wherein the encoder encodes or modulates beacon information of the plurality of beacons with the phase information to the light.

12. The robot system according to claim 1, wherein the beacon further comprising:  
a single sided mirror to reflect an incident light from the transmitting part at a predetermined angle.

13. The robot system according to claim 1, wherein the beacon further comprising:  
a double sided mirror to reflect incident light rays; and  
at least one transmitter provided to emit light towards respective sides of the double sided mirror at a predetermined angle.

14. The robot system according to claim 5, wherein the receiver further comprises:  
a conical mirror to concentrate light transmitted.

15. The robot system according to claim 10, wherein each of the plurality of beacons have different inherent beacon information.

16. A robot system including a mobile robot, comprising:  
a plurality of beacons;  
at least one transmitter provided to the beacon to transmit light to determine location of the mobile robot;  
at least one receiver provided to the mobile robot to receive the light transmitted via the at least one transmitter;  
a rotation driving part to rotating the at least one transmitter;  
an encoder to add phase information regarding rotation of the at least one transmitter with respect to a reference direction to the light; and  
a location determiner to determine a location of the mobile robot based on the phase information of the light received by the at least one receiver.

17. The robot system according to claim 16, wherein each of the plurality of beacons have different inherent beacon information.

18. The robot system according to claim 17, wherein the mobile robot determines the source of received phase information, and calculates a location of the mobile robot.

19. A beacon to generate light to determine location of a mobile robot, comprising:  
a transmitting part to transmit the light to determine the location;  
a rotation driving part to rotate the transmitting part; and  
an encoder to add phase information regarding rotation of the transmitting part.

20. The beacon according to claim 19, wherein the transmitting part further comprising:  
at least one transmitter rotated by the rotation driving part.

21. The beacon according to claim 19, wherein the transmitting part further comprising:  
a mirror disposed at an incline with respect to a horizontal direction;  
a transmitter to emit the light at a predetermined incident angle; wherein  
the rotation driving part rotates the mirror; and

the encoder adds the phase information regarding rotation of the mirror to the light.

22. The beacon according to claim 19, wherein the transmitting part further comprising: two transmitters to emit light towards double sides of the mirror.

23. The beacon according to claim 19, wherein the transmitting part has inherent information, and the encoder adds the beacon information and the phase information to the light.